

[0040] "HOMO" is the common chemical acronym for "highest occupied molecular orbital", while "LUMO" is the common chemical acronym for "lowest unoccupied molecular orbital". HOMOs and LUMOs are responsible for electronic conduction in molecules and the energy difference between the HOMO and LUMO and other energetically nearby molecular orbitals is responsible for the color of the molecule.

[0041] An optical switch, in the context of the present invention, involves changes in the electro-magnetic properties of the molecules, both within and outside that detectable by the human eye, e.g., ranging from the far infra-red (IR) to deep ultraviolet (UV). Optical switching includes changes in properties such as absorption, reflection, refraction, diffraction, and diffuse scattering of electro-magnetic radiation.

[0042] The term "transparency" is defined within the visible spectrum to mean that optically, light passing through the colorant is not impeded or altered except in the region in which the colorant spectrally absorbs. For example, if the molecular colorant does not absorb in the visible spectrum, then the colorant will appear to have water clear transparency.

[0043] The term "omni-ambient illumination viewability" is defined herein as the viewability under any ambient illumination condition to which the eye is responsive.

B. Optical Switches

[0044] Optical switches are described in greater detail in co-pending U.S. application Serial No. ⁰⁹981166, filed on ⁰⁴16, 2001 [PD-10005747-1]. A generic example taken from that application is depicted herein in FIG. 1, wherein a display screen 100 is shown that incorporates at least one colorant layer 101. The colorant layer 101 comprises a pixel array using electrical field switchable, reconfigurable, dye or pigment molecules of the present invention, described in greater detail below and generically referred to as a "molecular colorant". Each dye or pigment molecule is field switchable either between an image color (e.g., black) and transparent or between two different colors (e.g., red and green).